

REMARKS

Claims 10-11 and 15 were rejected under 35 USC 103 as being unpatentable over Kool et al. (US 6,599,416) in view of Rines (US 2,744,860).

Claim 12 was under 35 USC 103 as being unpatentable over Kool et al. in view of Rines and in further view of Zhou et al. (US 6,402,931).

Claims 13-14, 17-23, 25 and 26 were rejected under 35 USC 103 as being unpatentable over Kool et al (alone).

Claims 16 and 24 were rejected under 35 USC 103 as being unpatentable over Kool et al. in view of Zhou et al.

Claims 1-9 and 15 have been canceled.

Claims 10-14, and 16-26 remain active in the application.

With regards to the 35 USC 103 rejections applying Kool et al. as the base reference

Applicant has amended independent claims 10 and 13 (which is respectively applicable to the relevant dependent claims) to more clearly indicate operation of the ultrasound probe as a component of the invention.

Kool et al., as applied by the Examiner, teaches away from using an ultrasonic probe simultaneously while applying electrical pulses during the removal of corroded regions of the work-piece (turbine component). While Kool et al. teaches allowing a "slight amount of agitation" of the electrolyte solution, Kool et al. clearly cautions that "excessive agitation is usually undesirable". See paragraph 11, lines 9-21. The acceptable agitation as taught by Kool et al. is limited to the fluid motion of the electrolyte as it drains from the tank.

Further, Kool et al. teaches using ultrasound to shake loose degraded material as a supplemental post-stripping step which follows the application of the electrical current.

In contrast, the instant invention applies the sonic pulses contemporaneously with applying the current and voltage pulses so that the "ultrasound excitation improves the hydrodynamics of the corrosion removal process and thereby assist the electrochemical reaction" as taught in the Specification (see page 2, line 34 – page 3, line 3). Where the ultrasound excitation is applied to improve the corrosion/coating removal process, the application of the ultrasound excitation is applied contemporaneous with the application of current/voltage in the corrosion/coating removal process rather than as a separate step as taught in Kool et al.

Further, the secondary reference Rines is directed at electroplating a component and teaches the use of sonic vibration to enhance the electroplating process. Nothing in Rines addresses the removal of corrosion or removal of a coating and in fact, the techniques of Rines address a completely different problem than the problem solved by the instant invention. Rines teaches techniques for uniformly *applying* plating to a component, whereas the instant invention teaches *removing* corrosion from a component. The use of sonic vibrations during the component coating process is not equivalent to the use of sonic vibrations during the coating/corrosion removal process.

In applying Kool et al., one of ordinary skill in the art would avoid using the sonic pulses taught by Rines because the sonic pulses are applied to agitate the solution and Kool et al. teaches agitation above the flow of slowly draining fluid is undesirable.

Where Kool et al. teaches away from applying sonic vibration during coating/corrosion removal and Rines is directed at solving a different problem, Applicant asserts it would not have been obvious to combine Kool et al. with Rines to form the instant invention.

The reference Zhou et al. fails to teach or suggest any inclusion of an ultrasound probe in its electrochemical deburring/machining process.

None of the references applied by the Examiner including Kool et al. Rines, and Zhou et al. teach an ultrasound probe arranged in the electrolyte, wherein ultrasound excitation improves the hydrodynamics of the corrosion removal process and thereby assists the electrochemical reaction, as claimed in the instant invention.

With regard to the rejection of claims 13-14, 17-23, 25 and 26

Kool et al. has been applied by the Examiner as a single reference obviousness rejection over the cited claims. Applicant's amended claim 13 includes an ultrasonic probe and its operation which, as admitted by the Examiner at page 2, lines 11-12 of the Office Action, is not disclosed by Kool et al. alone.

Further with regards to claim 26

The Examiner asserts Kool et al. column 8, lines 8-17 and lines 30-39, column 13, lines 13-21, and column 9, lines 3-12 teach the "current source may be of the pulsed variety providing for a block like structure having a repeated sequence". These passages fail to teach the use of a

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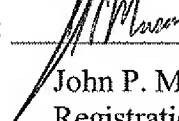
repeated sequence of a block of pulses. The passage suggests the “electrical current is sometimes pulsed” without teaching or suggesting the use of a repeated sequence of the pulses. Kool et al. has failed to appreciate applying repeated sequences of the pulse blocks.

Conclusion

In accordance with the above amendments and/or remarks the Examiner is requested to pass this application to issuance. The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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